

Patent claims

1. A self-cleaning plastics article obtainable by taking a plastics substrate and
 - 5 a) applying and curing a siloxane coating (a),
 - b) increasing the polar component of the surface energy of the cured siloxane coating to a value of at least 10 mN/m and
 - 10 c) applying and curing a coating (b) comprising photocatalytic TiO_2 particles.
2. The plastics article according to claim 1, characterized in that the plastics substrate encompasses cycloolefin copolymers, polyethylene terephthalates, polycarbonates and/or poly(meth)acrylates.
3. The plastics article according to claim 2, characterized in that the plastics substrate is composed of polymethyl methacrylate.
4. The plastics article according to one or more of the preceding claims, characterized in that the plastics substrate has an impact strength of at least 10 kJ/m² to ISO 179/1.
5. The plastics article according to one or more of the preceding claims, characterized in that the plastics substrate has a thickness in the range from 1 mm to 200 mm.
6. The plastics article according to one or more of the preceding claims, characterized in that the siloxane coating is obtainable by condensing a composition which encompasses at least 80% by weight of alkyltrialkoxysilanes, based on the content of condensable silanes.

7. The plastics article according to one or more of the preceding claims, characterized in that the siloxane coating encompasses condensable polysiloxanes whose molar mass is in the range from 500 to 1500 g/mol.
8. The plastics article according to one or more of the preceding claims, characterized in that the proportion of silicon in the siloxane coating (a) is at least 30% by weight, based on the total weight of the coating.
9. The plastics article according to one or more of the preceding claims, characterized in that the polar component of the surface energy of the siloxane coating (a) is lowered by curing to a value smaller than or equal to 6 mN/m, before the polar component of the surface energy is increased to at least 10 mN/m.
10. The plastics article according to one or more of the preceding claims, characterized in that the polar component of the surface energy of the siloxane coating (a) is increased, after curing, by treatment with alcoholic potassium hydroxide solution.
11. The plastics article according to one or more of the preceding claims, characterized in that the TiO_2 particles have a size in the range from 1 nm to 300 nm.
12. The plastics article according to one or more of the preceding claims, characterized in that the amount of the TiO_2 particles present in the second coating (b) is in the range from 0.01 to 90% by weight, based on the total weight of the second coating (b) after curing.

14. The plastics article according to one or more of the preceding claims, characterized in that the layer thickness of the siloxane coating (a) after curing is in the range from 1.5 to 30 μm .
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15. The plastics article according to one or more of the preceding claims, characterized in that the layer thickness of the coating (b) after curing is in the range from 0.01 to 2 μm .
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16. The plastics article according to one or more of the preceding claims, characterized in that the layer thickness of the coatings (a) and (b) after curing is in the range from 3 to 15 μm .
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17. The plastics article according to one or more of the preceding claims, characterized in that the scrub resistance of the plastics article to DIN 53778 is at least 15 000.
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18. The plastics article according to one or more of the preceding claims, characterized in that the plastics article has a modulus of elasticity to ISO 527-2 of at least 1500 MPa.
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19. The plastics article according to one or more of the preceding claims, characterized in that the plastics article has a weathering resistance to DIN 53 387 of at least 5000 hours.
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20. The plastics article according to one or more of the preceding claims, characterized in that the plastics article has a transparency to DIN 5033 of at least 70%.
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21. The plastics article according to one or more of the preceding claims, characterized in that the

plastics article has a yellowness index smaller than or equal to 5 after 5000 hours of UV irradiation.

- 5 22. A process for producing self-cleaning plastics articles according to one or more of claims 1 to 21, characterized by taking a plastics substrate and
- 10 a) applying and curing a siloxane coating (a),
 b) increasing the polar component of the surface energy of the cured siloxane coating to a value of at least 10 mN/m and
- c) applying and curing a coating (b) comprising photocatalytic TiO_2 particles.